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Investigation of an atmospheric pressure helium plasma jet with floating ground bare metal nozzle[1] WEN-CHAO ZHU, Tsinghua University, DIRK LUGGENHÖLSCHER, Ruhr-University Bochum, WEN-CONG CHEN, FENG XIE, FEI-XIANG LIU, YI-KANG PU, Tsinghua University — APPJ generated in a quartz capillary tube with kHz power has been attracting significant attention for the "bullet-like" form that composed of the propagating ionization front. A plasma jet with a floating ground bare metal electrode at the nozzle is reported here. A simple current probe method and an optical emission method using a high-speed photodiode are used to investigate the temporal behavior of the bullet propagation. By measuring the spatial and temporal jet current and optical emission, we show that the plasma jet launched outside the nozzle is formed by the charge accumulation on the floating ground electrode after the dielectric barrier discharge between the two electrodes. The propagation mechanism of the plasma jet is similar to the positive glow corona discharge.

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